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# Overview

Access the latest version of the *9800 Installation Report/Checklist,* 00-879060, and use it in conjunction with this document. Follow the installation procedures in the order written, and note that the sections of the procedures correspond to the same section title in the *Report/Checklist*.

# Unpacking the System

***Note**: The Workstation and C-Arm ramps are usually located on top of the Workstation's enclosure. However, if the system is shipped by air freight, the C-Arm ramp is typically stored inside the C-Arm enclosure.*

1. Before unpacking, inspect the shipping enclosure/boxes for damage and report to the shipper if available. Note any damage in the Installation Comments section of the *Report/Checklist,* 00-879060.
2. Remove the banding from the Workstation and C-Arm shipping enclosure/pallets. See Figure 1 (next page).
3. Remove the ramps from the top of the Workstation enclosure. See Figure 1 (next page).
4. Remove the cardboard cap and lift the cardboard from the top of both enclosures. Discard both cardboard items.
5. Remove the clear plastic covers from the Workstation and the C-Arm.
6. Use the depalletization instructions located on the Workstation cable hanger (00-881509-XX) and C-Arm's cross-arm (00-881508-XX) to depallet the Workstation and the C-Arm.
7. Record the results in the latest version of the *9800 Installation Report/Checklist*, 00-879060.

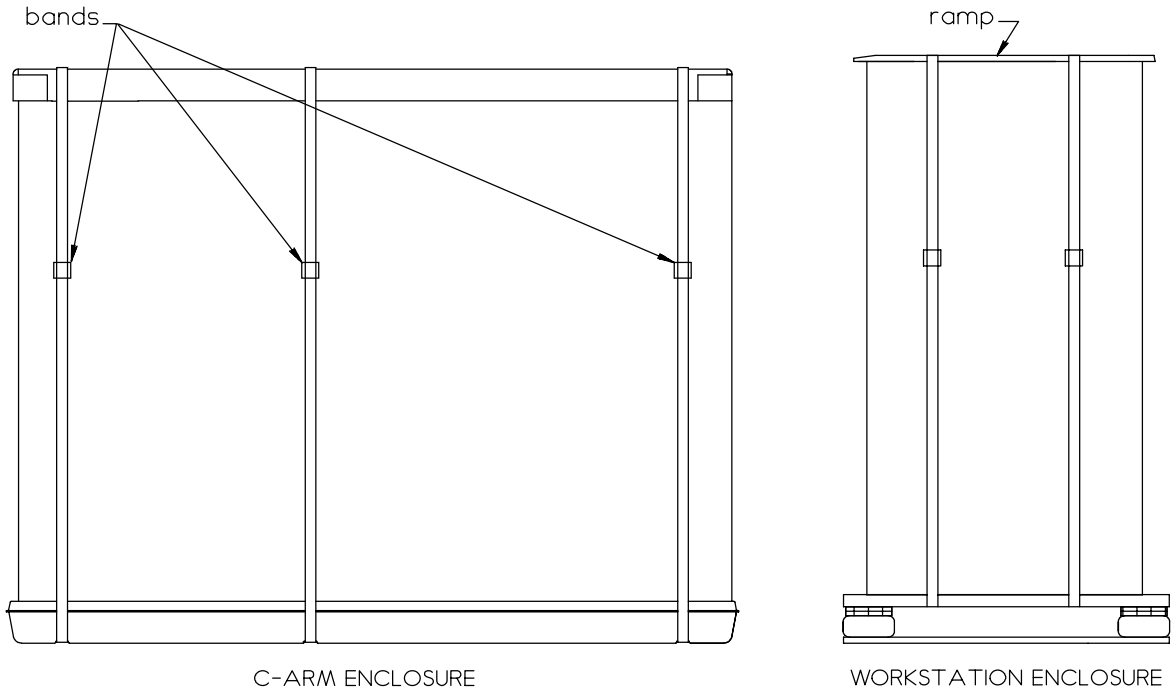


**Figure 1 – 9800 C-Arm and 1k x 1k Workstation Enclosures**

# Depalletization Performed By

Put a check in the appropriate box in the table in the corresponding section of the *9800 Installation Report/Checklist*, 00-879060 (latest version). Note in the Installation Comments section of the *Report/Checklist* if only a Workstation or C-Arm was depalletized.

# Installation Report

Visually inspect the system according to the separate C-Arm and Workstation matrices in the *9800 Installation Report/Checklist*, 00-879060. Each matrix lists the area to inspect in the left-most column, and the possible condition on the top row.

The areas to inspect are grouped according to the larger visible, easily accessible assemblies and/or modular parts of the system. Each inspection of an assembly area should include its visible component parts and sub-assemblies; for example, inspection of the Image Intensifier should account for its cover, handles, screws, etc.

## C-Arm Damage Inspection

Inspect the C-Arm for damages and record the information in the corresponding section of the latest version of the *OEC 9800 Installation Report/Checklist.*

## Workstation Damage Inspection

Inspect the Workstation for damages and record the information in the corresponding section of the latest version of the *OEC 9800 Installation Report/Checklist.*

# Inventory of Customer Items

Inventory the accessory kits for the C-Arm and Workstation to locate the items listed in the table in the corresponding section of the *Report/Checklist.* Leave these items for the customer when the installation is complete. If a Workstation is installed alone, then items related to the C-Arm will not be present.

## C-Arm Items

Write the quantity present or missing in the appropriate column in the C-Arm Items table in the *Report/Checklist*.

The Mobile C-Arm keys are attached to one of the binder rings inside the 9800 C-Arm Operator's Guide. Give the keys to the customer once the installation has been completed.

## Workstation Items

Write the quantity present or missing in the appropriate column in the Workstation Items table in the *Report/Checklist*.

## Optional Equipment

In the Optional Equipment table, put a check mark by each option shipped with the system to confirm that the option is present.

If no options are provided, check the No Options checkbox only. Write in any options that are present but not listed.

# Installation Procedures

Follow these installation procedures in the order written to get the 9800 system operational, and record the information asked for in the corresponding sections of the *OEC 9800 Installation Report/Checklist*, 00-879060 (access the latest version).

# Cover Removal, Internal & Cable Inspection, Partial Setup

***Note**: Observe electrostatic discharge safety procedures.*

1. Check the antistatic drag cable on the Workstation and the C-Arm.
2. Inspect the interconnect cable, AC power cable and the high voltage cable for wear, abrasion and bent or broken pins.
3. Remove Workstation covers and inspect the internal cables and PCB seating. Look for loose parts. See Figure 2 (next page).

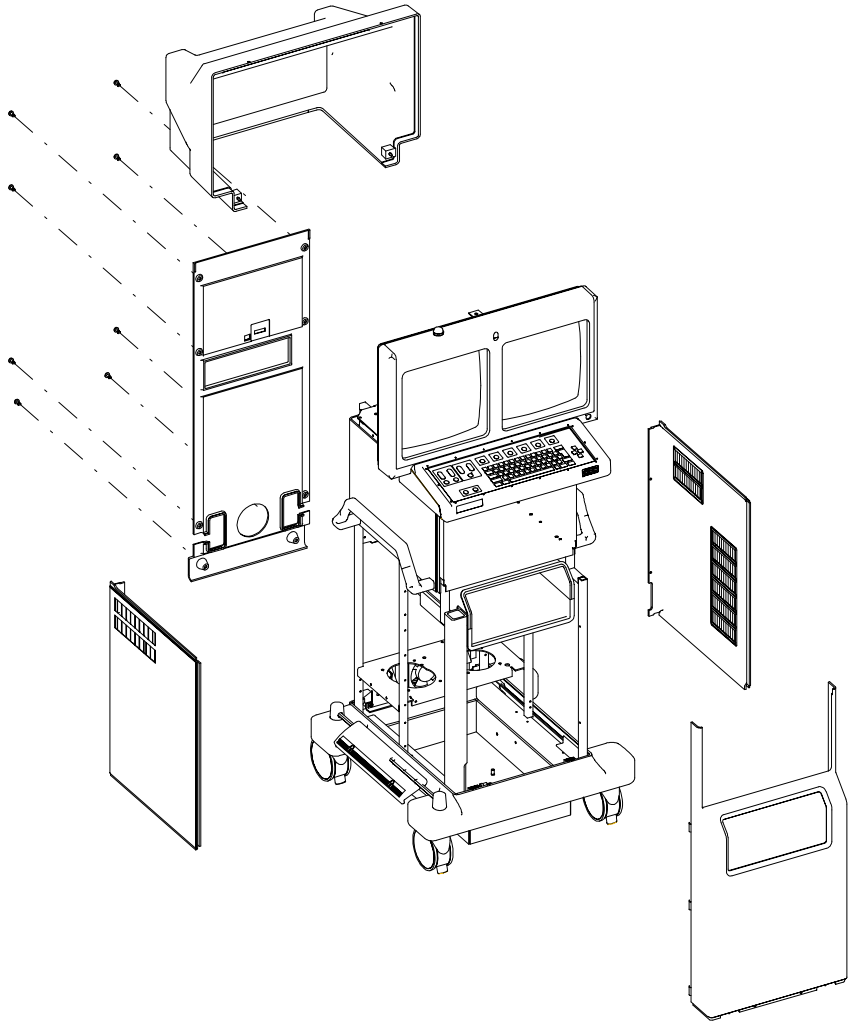

**Figure 2 – Removing the Workstation's Covers (covers arranged for illustration purposes)**

6. Install the skin spacer on the C-Arm.
7. Remove the C-Arm's covers and inspect the internal cables and PCB seating. Look for loose parts. See Figure 3.
8. Verify the eye-bolts are removed from underneath the C-Arm's T-base (near the wheels on each side).

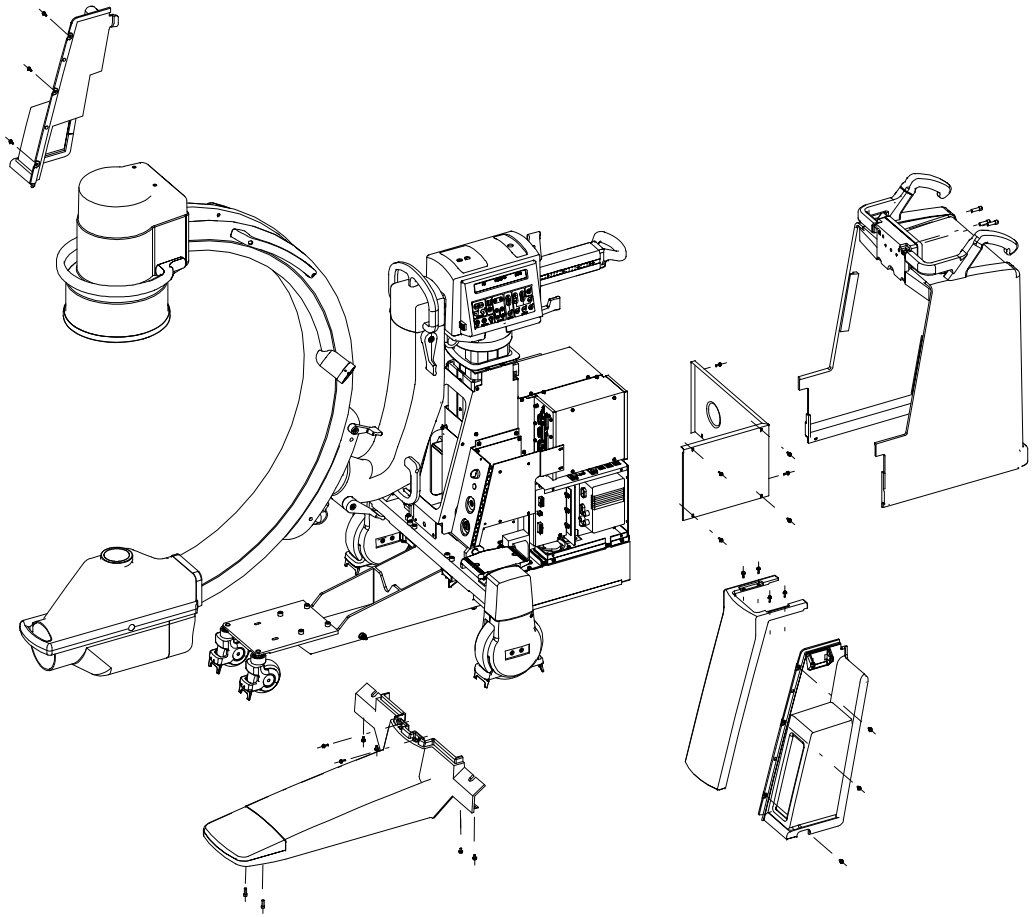

**Figure 3 – Remove the C-Arm Covers (covers arranged for illustration purposes)**

# Mechanical Checks

1. Check the entire range of Wig-Wag movement.
2. Check the entire range of Horizontal Cross-arm movement.
3. Check the entire range of Flip-Flop/C-arm pivot.
4. Check the entire range of C-arm orbital rotation.
5. Check the entire range of L-arm rotation (N/A on Super C).
6. Check the C-Arm Brake Pedal operation (forward lock, neutral and rear lock) positions.
7. Check the entire range of C-Arm steering.
8. Check the Workstation Brake Pedal operation (up, neutral, down) positions.

# The Power Cord Assembly

There are two power cord assemblies. The two Power Cord assemblies are wired differently to accommodate the different voltages. The correct power cord assembly must be used for proper operation of the system. One power cord assembly is used for voltage sources ranging from 100 - 127 VAC and different power cord assembly is used for voltage sources ranging from 200 – 250 VAC.

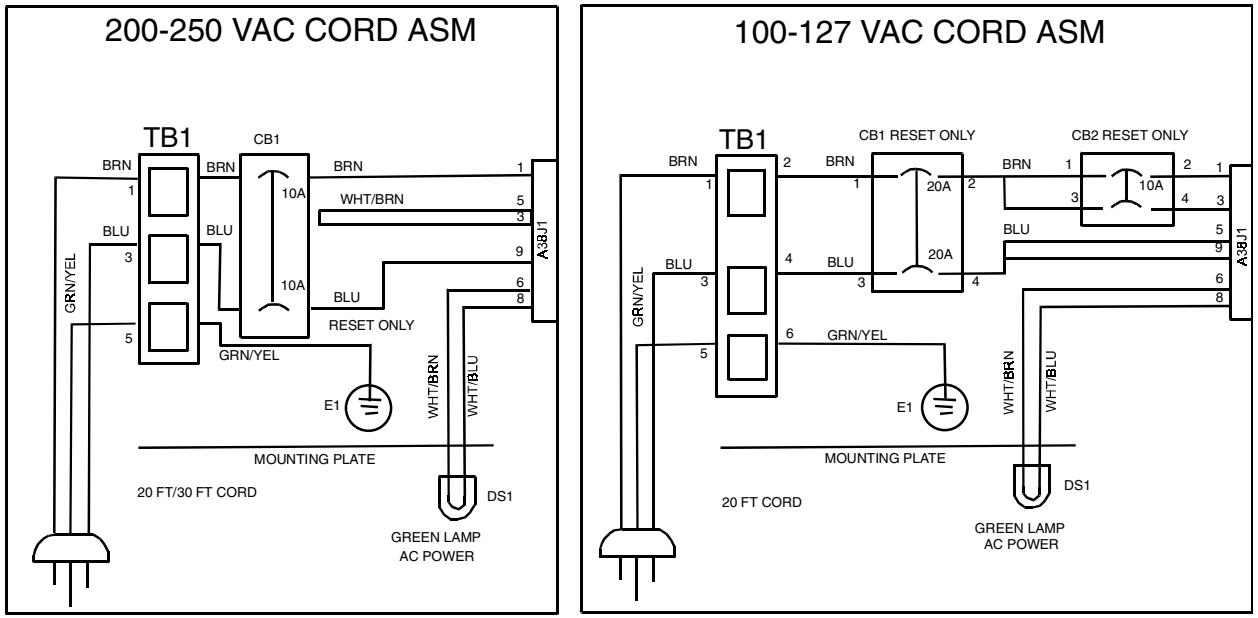


**Figure 4 – Power Cord Asm.**

***Note***: *The factory has attempted to provide the proper power cable plug assembly, but due to different international requirements, the proper power plug assembly may not be furnished. If assistance is required, contact GE OEC Medical Systems, Inc.*

***WARNING*** *Electrical circuits inside the equipment use voltages that are capable of causing serious injury or death from electrical shock. Use appropriate precautions.*

# Isolation Transformer Strapping

To match the nominal wall receptacle voltage to the input (primary) of the isolation transformer, you must select the correct tap voltage for the wires on Primary 1 (BRN, WHT/BLU) and the wires on Primary 2 (WHT/BRN, BLU).

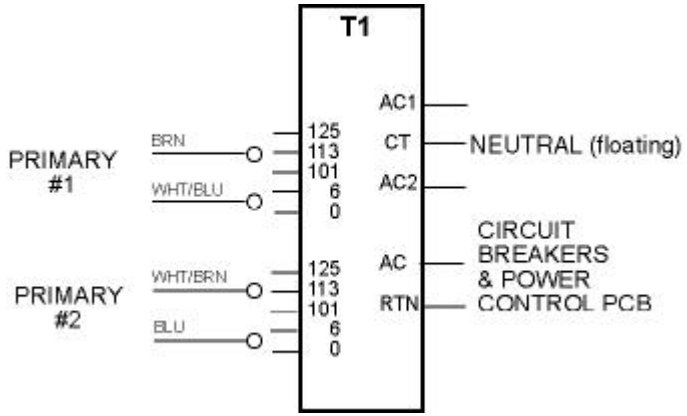


**Figure 5 – Partial Schematic Diagram of the Isolation Transformer**

1. Connect the interconnect cable to the C-Arm and plug the power cord into the wall outlet.
2. If the system is equipped with a 100-127 VAC power cord, measure the voltage from the BRN wire to WHT/BLU on T1 primary and record the results in the table on p. 5 of the *Report/Checklist*.

   If the system is equipped with a 200-250 VAC power cord, measure the voltage from the BRN wire to WHT/BLU on the T1 primary and record the results in the table on p. 5 of the *Report/Checklist*.

***Note**: If the voltage measured in step one measures from 100 –127 VAC use Table 1 (next page). If the voltage measured in step one measures between 200 –250 VAC use Table 2 (next page).*

*For example, if the voltage measured equals 112 VAC, use Table 1 (100 – 127 VAC). The correct voltage taps would be*

*found in the row described by voltage range 110.0 to 115.9. Connect the wires as described in that row.*

*For Example: If the voltage measured equals 224 VAC, use Table 2 (220 – 250 VAC). The correct voltage taps would be found in the row described by voltage range 220.0 – 231.9 VAC. Connect the wires as described in that row.*

3. Find the corresponding voltage range in the first column of the table and determine the voltage taps.

**Table 1 (100 - 127 VAC )**

| If the AC line voltage determined in step 1 is | Connect WHT/BLU wire to **Primary #1** | Connect BRN wire to **Primary #1** terminal… | Connect BLU wire to **Primary #2** terminal… | Connect WHT/BRN wire to **Primary #2** |
|---|---|---|---|---|
| 104.0 to 109.9 | 6 | 113 | 6 | 113 |
| 110.0 to 115.9 | 0 | 113 | 0 | 113 |
| 116.0 to 121.9 | 6 | 125 | 6 | 125 |
| 122.0 to 128.0 | 0 | 125 | 0 | 125 |

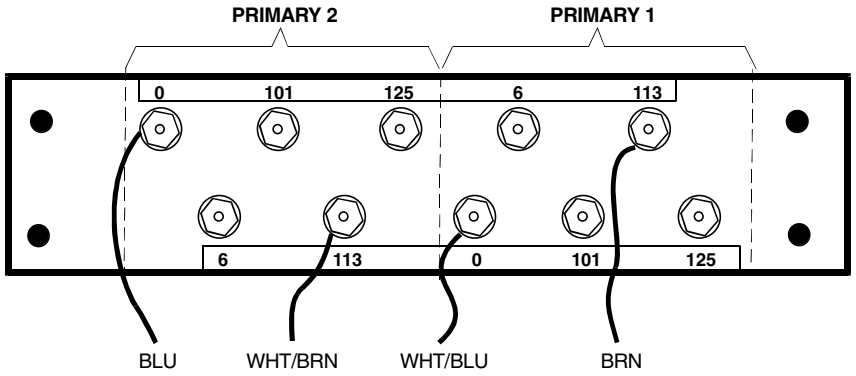


**Figure 6 – Isolation Transformer (T1) Tap Locations for 112 VAC**

| Table 2 (200 – 250 VAC) | | | | |
|---|---|---|---|---|
| If the AC line voltage determined in step 1 is | Connect WHT/BLU wire to **Primary #1** | Connect BRN wire to **Primary #1** terminal… | Connect BLU wire to **Primary #2** terminal… | Connect WHT/BRN wire to **Primary #2** |
| 196.0 to 207.9 | 0 | 101 | 0 | 101 |
| 208.0 to 219.9 | 6 | 113 | 6 | 113 |
| 220.0 to 231.9 | 0 | 113 | 0 | 113 |
| 232.0 to 243.9 | 6 | 125 | 6 | 125 |
| 244.0 to 256.0 | 0 | 125 | 0 | 125 |

4. With all options switched ON and the system fully booted, measure the following voltages at the primary and secondary of the isolation transformer (T1) and verify that they meet the specification. Record the measured value in the corresponding table in the *Report/Checklist*.

| Ref | Transformer winding | From | To | Spec |
|---|---|---|---|---|
| A | Primary 1 winding | WHT/BLU | BRN | Receptacle VAC |
| B | Primary 2 winding | BLU | WHT/BRN | Receptacle VAC |
| C | Secondary 1 | CT | AC1 | 119 VAC ± 3.0 |
| D | Secondary 1 | CT | AC2 | 119 VAC ± 3.0 |
| E | Secondary 2 | RTN | AC | 119 VAC ± 3.0 |

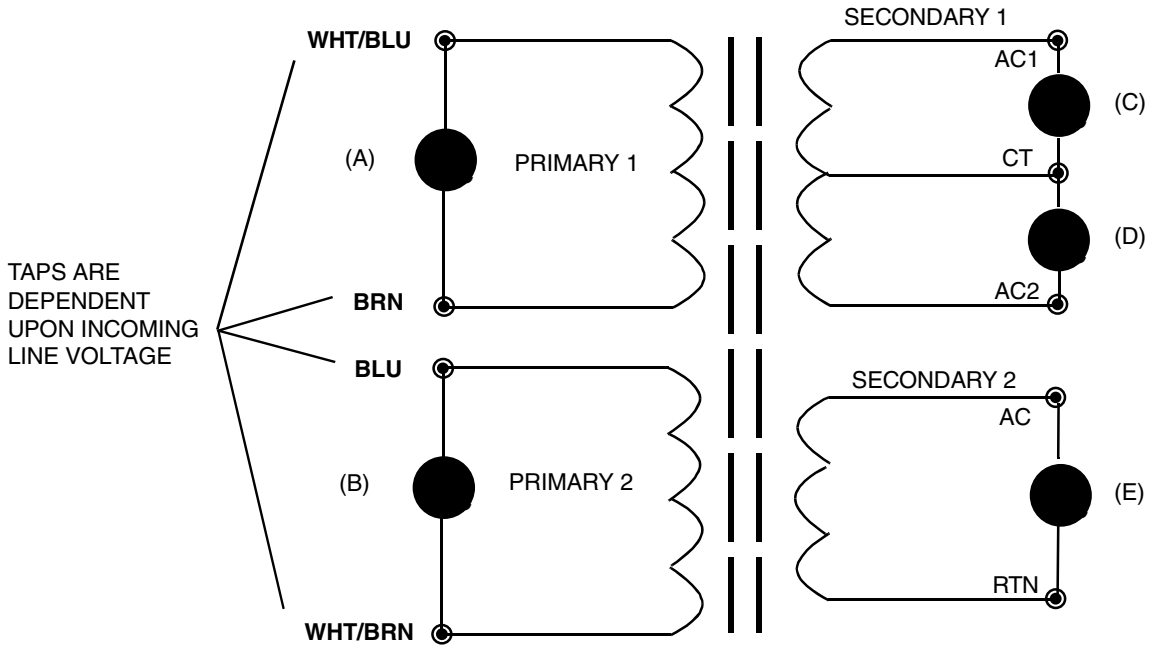


**Figure 7 – Isolation Transformer VAC Measurement**

# Power ON System

1. Place the  C-Arm's keyswitch in the ON position (clock-wise) and then place the Workstation's power switch in the ON position. Verify that the Workstation and C-Arm complete their software boot and initialization with no errors reported on the displays.
2. Verify that the Workstation's elapsed time meter is functional.
3. Verify that the cooling fans are operating on both the Workstation and the C-Arm.

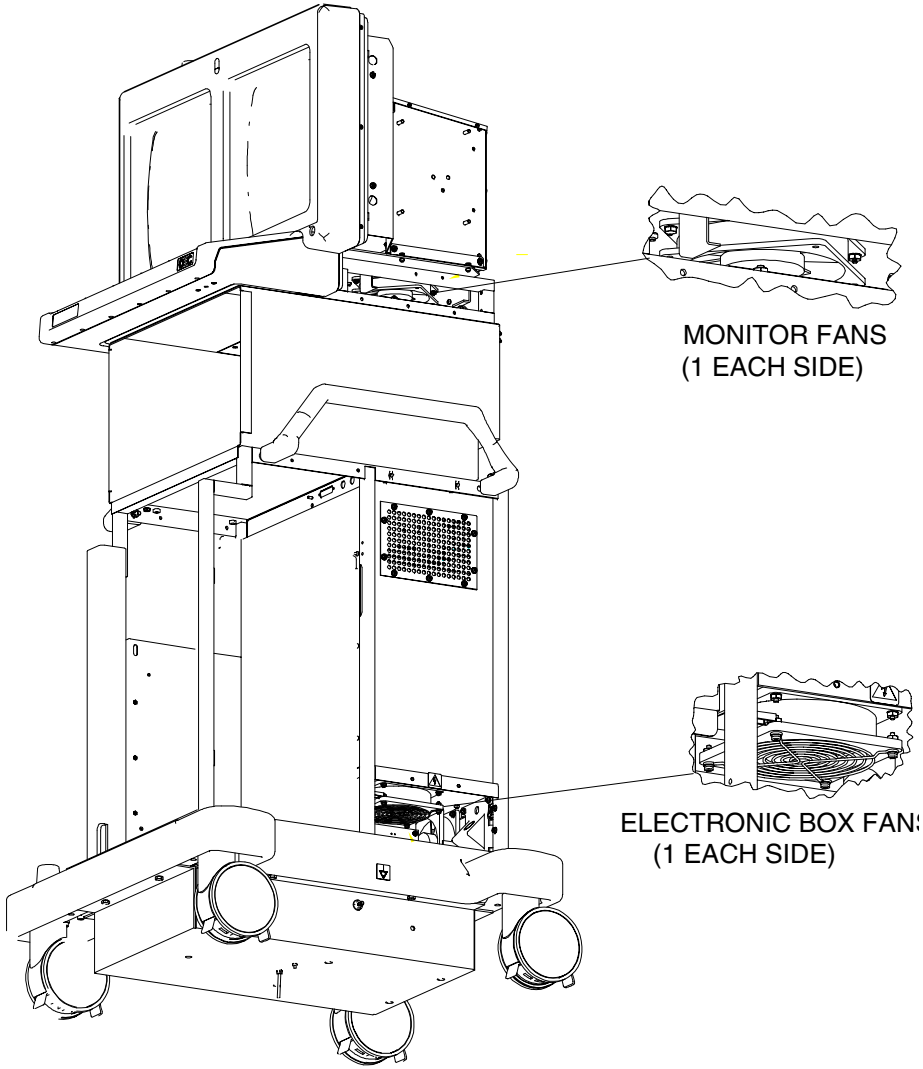


**Figure 8 – Workstation Fans**

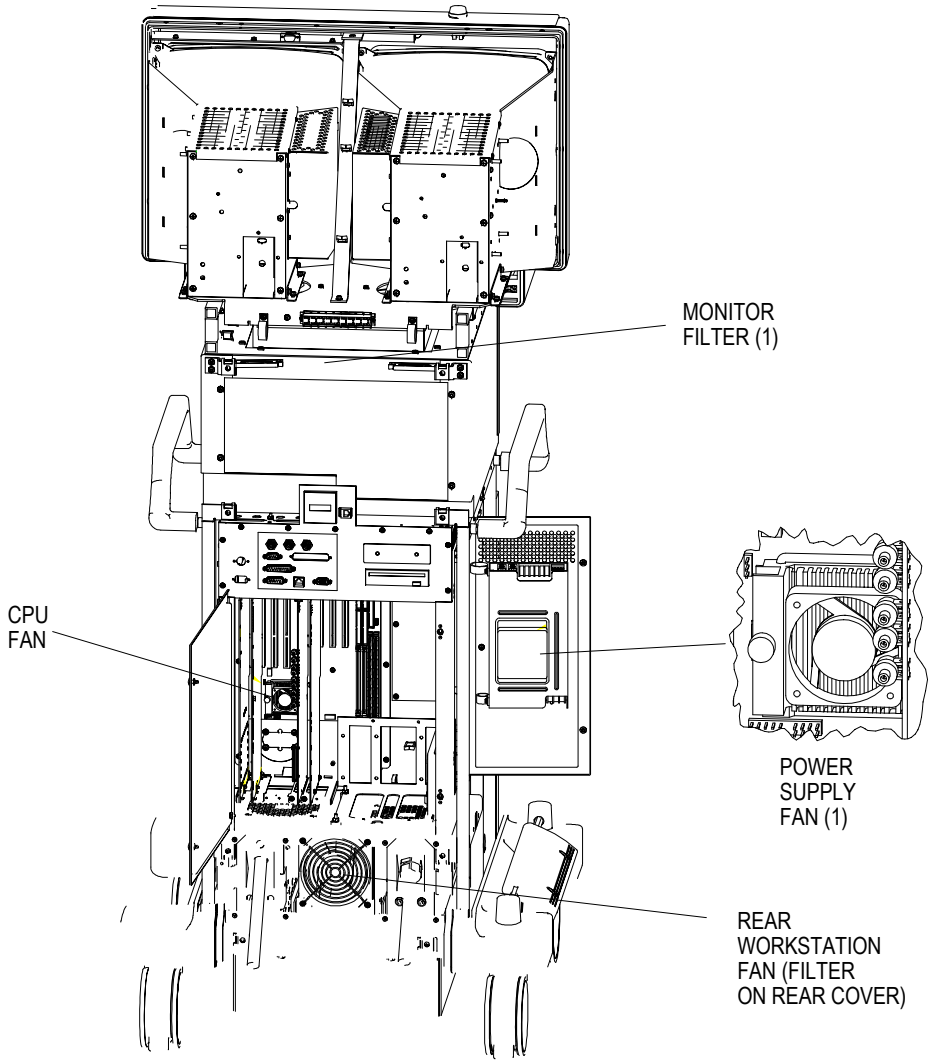


**Figure 9 – Workstation Fans**

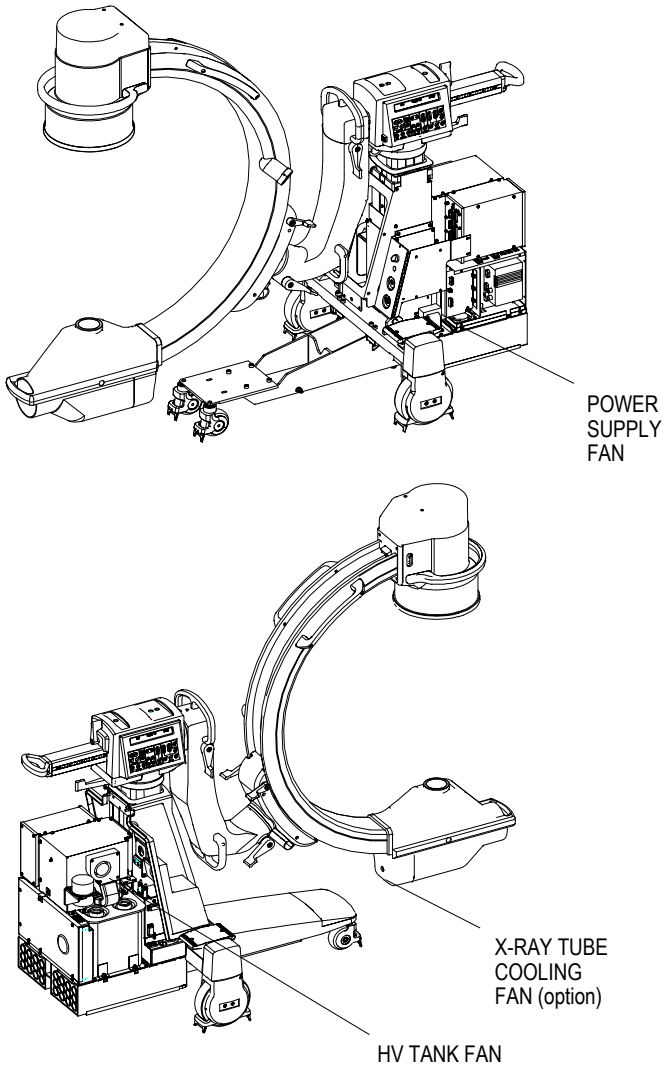


**Figure 10 – C-Arm Fan Locations**

4. Verify that the X-ray tube's anode is rotating by listening for a "whirring" sound.
5. Verify operation of the vertical column lift switches.
6. **Press and hold** a FAST STOP switch while verifying that vertical column operation is disabled, then release the switch and verify that X-ray generation is disabled and the message FAST STOP ACTIVATED is displayed on the C-Arm's Control Panel display. Reboot the system by placing the Workstation's power switch in the OFF position for five seconds and then back to ON.
7. Turn the C-Arm's keyswitch to the STANDBY position (counter-clockwise) and verify that vertical column operation is disabled, X-ray generation is disabled and the message KEYSWITCH IN STANDBY - XRAYS AND LIFT DISABLED scrolls across the C-Arm's Control Panel display.
8. Verify the ambient light sensor works by covering it and verifying that the monitor dims.

# Line Voltage Regulation

***WARNING*** *This procedure produces high energy X-rays. Take the appropriate precautions. Because of the high radiation output produced, non-service personnel should not be present in the room during the following test.*

1. Measure the wall outlet voltage (*Vn*) or use the value measured in the Isolation Transformer Strapping procedure. Write the measured value in the corresponding section of the *Report/Checklist*.
2. While taking a radiographic exposure at 100 kVp @ 300 mAs, measure the wall outlet voltage (*Vl*) again. Write the measured value in the corresponding section of the *Report/Checklist*.
3. Use the following formula to calculate the percentage of line voltage regulation and record the result in the corresponding section of the *Report/Checklist*.

   $$\text{Line Regulation} = 100 \times \frac{(Vn - Vl)}{Vl} = \%\ \text{Line Voltage Regulation}$$

4. If the results above do not fall within the range of 0 - 15 %, note this in the *Report/Checklist*, and inform the hospital administration that they will need to correct this problem. Note this also on the FSR or Case.

# C-Arm Control Panel and Foot/handswitch Check

***WARNING:*** *Some of the following procedures produces X-rays. Take appropriate precautions.*

1. Press the X-ray ON switch and verify the following Image Orientation functions:
   A. Image Rotation key rotates the image clockwise and counter-clockwise.
   B. Image Invert key inverts and reinverts the image.
2. Pressing the field size key repeatedly allows you to select any of the three available field sizes: NORM, MAG1 and MAG2.
3. Using the Converging Line pairs/millimeter (lp/mm) tool on the Image Intensifier, verify the resolution in lp/mm is equal to, or greater than, the values listed below. Record the measured values in the corresponding section of the *Report/Checklist*:

| 9″ II / 60HZ | 9″ II / 50HZ | 12″ II / 60HZ | 12″ II / 50HZ |
|---|---|---|---|
| NORM ≥ 2.3 | NORM ≥ 2.3 | NORM ≥ 1.7 | NORM ≥ 1.7 |
| MAG1 ≥ 3.2 | MAG1 ≥ 3.2 | MAG1 ≥ 2.3 | MAG1 ≥ 2.3 |
| MAG2 ≥ 3.8 | MAG2 ≥ 3.8 | MAG2 ≥ 3.0 | MAG2 ≥ 3.0 |

4. Press the SAVE key and verify that it saves left monitor image to the Workstation hard-drive.
5. Press the SWAP key and verify the image on the left monitor shifts to the right monitor.
6. Press each of the following collimator switches and verify that the graphical icon indicates the correct collimator function:
   A. Collimator iris opens/closes
   B. Collimator semitransparent leaves open and close
   C. Collimator semitransparent leaves rotate

7. Press each of the following collimator switches while pressing the X-Ray ON switch and verify each of the following collimator functions again.
   A. Collimator iris opens/closes
   B. Collimator semitransparent leaves open and close
   C. Collimator semitransparent leaves rotate
8. Press the MANUAL CONTRAST/BRIGHTNESS key and verify that you can increment and decrement through a series of preset levels of contrast and brightness.
9. Press the AUTO CONTRAST/BRIGHTNESS key and verify that the system automatically selects the optimum amount of contrast and brightness.
10. Press the kVp and mA keys and verify that the technique can be adjusted manually.
11. Select Auto Fluoro mode and the NORM field size and verify that the kVp tracks accurately as copper filters are inserted into the field per the following ranges, then record the kVp value in the corresponding table in the *Report/Checklist*.

| Copper Filters | kVp range |
|---|---|
| 1 | 61 kVp ± 3 kVp |
| 2 | 71 kVp ± 3 kVp |
| 3 | 79 kVp ± 3 kVp |

12. Select HLF mode via the Workstation Mode screen.
   A. Cover the II with 4 layers of lead aprons and press the right Foot/handswitch.
   B. Verify that the audible tone beeps at twice the normal rate.
   C. Verify that the mA is driven higher than the Fluoro limit of 10 mA.
13. Select PULSE mode via the C-Arm Control Panel.
   A. Select a pulse rate of 4 PPS via the Workstation Mode screen and press the right foot/handswitch.

B. Verify that the audible tone beeps at twice the normal rate and the X-ray indicator flashes.

C. Select a pulse rate of 8 PPS via the Workstation Mode screen and press the right foot/handswitch.

D. Verify that the X-ray indicator flashes at approximately twice the rate as the previous step.

E. Verify that the mA is driven higher than the Fluoro limit of 10 mA.

14. Select DIGITAL SPOT via the Workstation Mode screen.

    A. Press the right hand/foot switch.

    B. Verify that a short-term HLF exposure is taken and automatically saved to the Workstation hard-drive.

    C. Remove the 4 layers of lead aprons from the II.

15. Press the MODE switch located on the C-Arm Control Panel, and foot/hand switch. (The MODE switch gives a dumb beep on ESP, GSP, & SP systems.)

    A. On vascular systems, verify the system toggles between standard fluoro mode and vascular imaging mode. Verify a dumb beep on ESP, GSP, & SP systems..

    B. On vascular systems, with vascular imaging mode selected, verify ROADMAP mode masks out image and leaves a white trace of any object that is moved in the field. (Non-applicable for ESP, GSP, SP systems.)

    C. On vascular systems, with vascular imaging mode selected, verify SUBTRACTION mode masks out image and leaves gray background. (Non-applicable for ESP, GSP, SP systems.)

16. Low Dose mode operation:

    A. Press the Low Dose key. The corresponding LED will illuminate when Low Dose mode is selected.

    B. Press the Low Dose key again to deselect Low Dose mode. The corresponding LED will extinguish.

17. Press and hold the ALARM RESET key for approximately 2 seconds. Verify the Fluoro time displayed on the C-Arm Control Panel is reset to zero.

18. Select FILM mode and:

    A. Take a 120 kVp 100 mAs shot and verify that three beeps are heard after the exposure and no errors are displayed.

    B. Take a 100 kVp 300 mAs shot and verify that three beeps are heard after the exposure and no errors are displayed.

# Workstation Keyboard Check

***WARNING*** *This procedure produces X-rays. Take appropriate precautions.*

1. Verify the EDGE ENHANCEMENT function displays an indicator bar and that the amount of edge enhancement can be increased and decreased.
2. Verify the NOISE FILTER function displays an indicator bar and that the amount of filtering can be increased and decreased. The noise in the image should decrease as noise filtering is increased.
3. Verify the ZOOM function displays a square box known as the region of interest (ROI) and that you can magnify the ROI by touching the 2X and 4X buttons.
4. Verify the NEGATE function reverses the light and dark values on the image displayed on the left monitor.
5. Verify the CONTRAST function displays an indicator bar and that the amount of contrast can be increased and decreased.
6. Verify the BRIGHTNESS function displays an indicator bar and that the amount of brightness can be increased and decreased.
7. Verify the AUTO CONTRAST/BRIGHTNESS automatically selects the optimum values of contrast and brightness.
8. Verify the SWAP function exchanges images from the left and right monitors (need to have two different images on the left and right monitors).
9. Verify the SAVE function saves the image on the left monitor to the Workstation's hard drive.
10. Verify the PATIENT INFORMATION function activates the Patient Information screen. Enter patient information, display scheduled patients, display saved exams screen.
11. Verify the IMAGE DIRECTORY function allows you to review, print, and archive stored images and dose information.
12. Verify the IMAGE ANNOTATION function allows you to place markers, add comments and crop images.
13. Verify the SPECIAL APPLICATIONS function allows access to additional applications, if available.
14. Verify the CUSTOMIZE function allows access to the Customize screen.

# Backup the Configuration Files

If the Remote Utilities Tool is not installed on the Laptop, install it now.

1. Connect the RUT cable between the Serial port on your Laptop and the ARCNET connector on the Workstation.
2. Double Click on the RUT Icon.
3. Once RUT starts Click on the Tools pulldown menu.
4. Then Click on Connect.
5. When the “Login Succeeded” Window appears click OK.
6. Click on the Tools menu and Select “Upload and Save All.”
7. When the Upload Windows Appears make sure that All is selected and click on OK.
8. The Save window appears. In the File Name Box type in the Serial Number of the System then click on Save. Repeat this six times for all the different files

***Note**: You will be saving six files with six different extensions, .cfg, .cfw, .clw, .clc, .fcl, .mal.*

9. Then copy these files to a floppy disk. They are saved under the directory

   *C:\Program Files\rut\rut data files*.

10. Leave the floppy with the system.

# Options

Refer to the 1k x 1k Workstation or Series 9800 C-Arm Operator's Guide for operating instructions if necessary. Check the appropriate boxes in the corresponding section of the *Report/Checklist*. Ignore any following sections that are non-applicable to the system.

## Cine Archive Disk Test

1. Verify that a cine run can be recorded to the hard disk.
2. Verify the recorded run can be played back.

## High Capacity Disk Test

1. Using the Image Directory verify that dynamic and static image(s) can be saved to disk.

## VCR Test

1. Verify the VCR RECORD function.
2. Verify the VCR PLAY function.

## IR Transmitter Test

1. Press the Remote Control Screen key and verify that the remote control screen displays on the monitor.
2. Use the cursor control to move the cursor to an executable button and press the ENTER key.
3. Press the EXIT key to exit.

## Digital Hardcopy Camera test

1. Verify operation of the digital hardcopy camera. Refer to the Operator's Guide Supplement if necessary.

## Instant Film/Paper (Onboard) Printer

1. Remove the shipping pins from the printers front ventilation grill. There are two pins connected with tape which secure the thermal printhead.
2. Verify that an image can be printed to the Instant Film/Paper Printer. Refer to the Operator's Guide Supplement if necessary.

## Thermal Printer Test

1. Verify an image can be printed to the thermal printer.

## DICOM

1. If DICOM option is available: Contact the system administrator and ask them if they are ready to have the DICOM option installed.

   If they are ready, have the system administrator complete the DICOM Network Questionnaire found as the last section of this document (Appendix 2), then attach it to the *9800 Installation Report/Checklist* and mail them in together. Then Continue with DICOM installation.

   If the Hospital is not ready for DICOM installation: photocopy the DICOM Network Questionnaire, leave it with the system administrator or equivalent, and schedule a time to complete DICOM installation. In the *Report/Checklist*, record the scheduled time that DICOM is to be installed (indicate time by MMDDYY). Continue with system installation.

***Note**: If the System Administrator completed a "copy" of the Network Questionnaire, attach the copy to the* 9800 Installation Report/Checklist *and mail them in together.*

2. Make electrical connections and configure the Workstation software.

3. Verify images can be archived and printed via the DICOM interface.
4. Verify that scheduled exams can be downloaded via the DICOM interface.

## 9800 FluoroTrak™

1. If the FluoroTrak option is installed, verify that the FluoroTrak application software booted successfully and no error messages are visible on the Flat Panel Display (FPD).
2. Assemble the Probe.

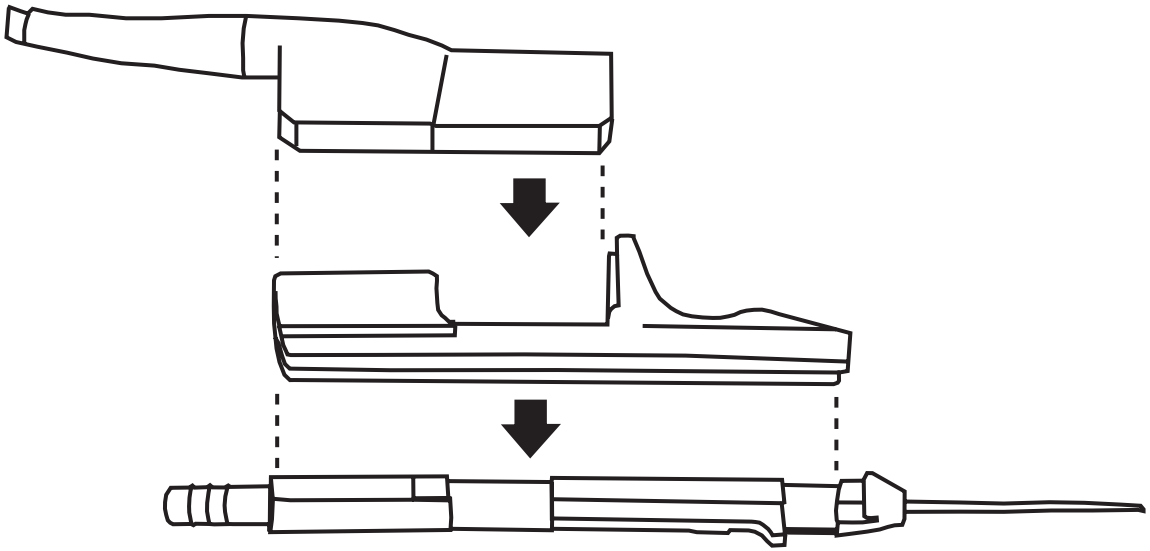

**Figure 11. Probe Assembly**

3. Install the Calibration Fixture on the Image Intensifier.

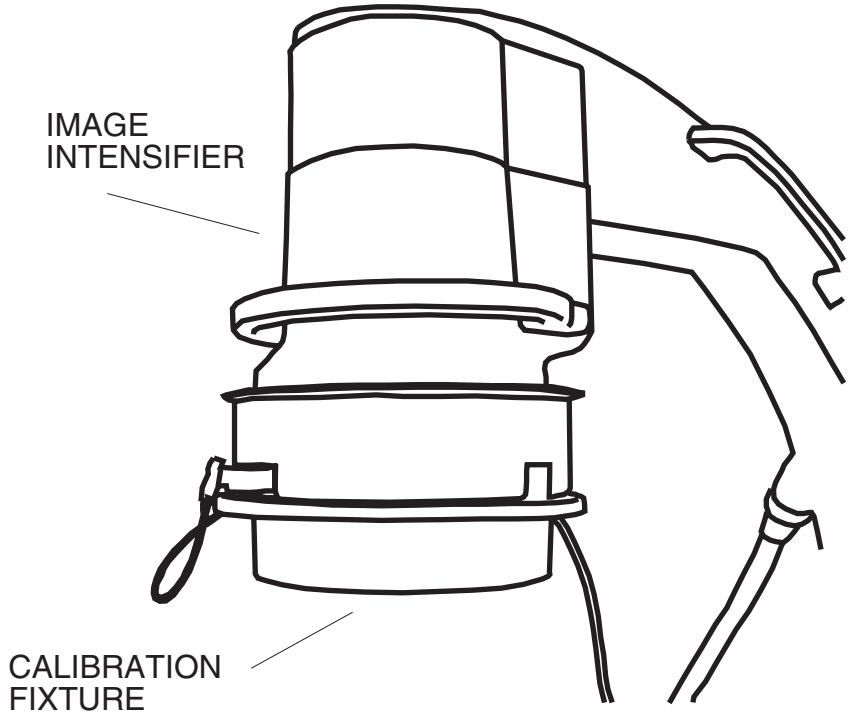


**Figure 12. Calibration Unit Mounted on Image Intensifier**

4. Position the C-arm so the II is closest to the floor.
5. Complete a calibration by performing the following.
   A Connect the Transmitter, and both receivers (Probe and Calibration Fixture) to the panel located on the left side of the Workstation.
   C. Place the tip of the Probe in the dimple located on the Transmitter.

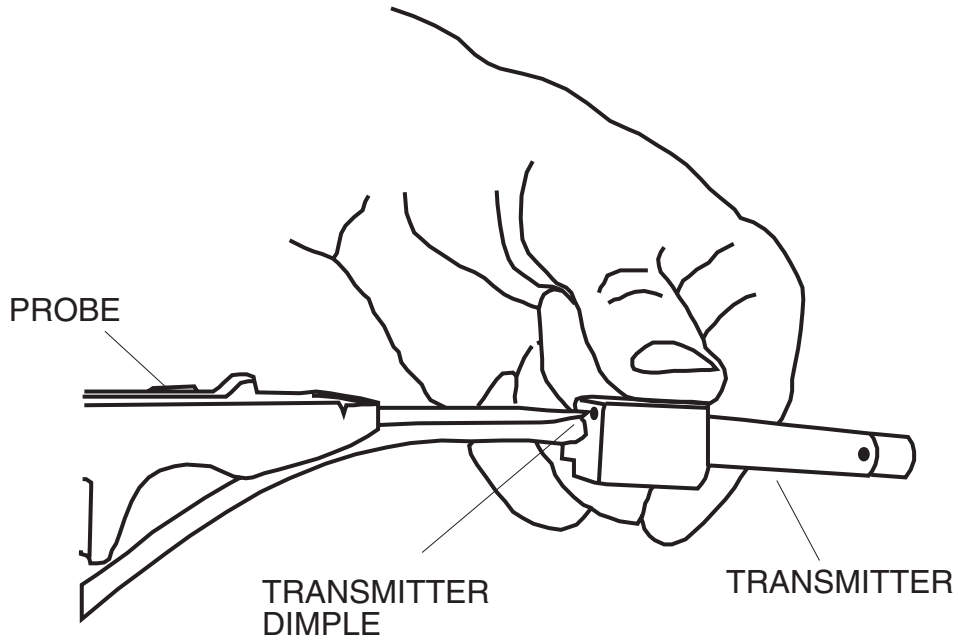


**Figure 13. Probe Touching Dimple on Transmitter**

   D. Press the CALIBRATE button on the FPD touch screen.

***Note**: When the calibration is accepted the CALIBRATE button on the Visualization menu changes from orange to green.*

6. Verify tracking by performing the following.
   A. Place the tip of the Probe in the dimple located on the Transmitter.
   B. Select the VERIFY button on the Visualization menu.

***Note:*** *The screen changes to the Visualization Option menu.*

   C. Select the SET VERIFICATION REFERENCE POINT button and verify that the button turns green.
   D. Select the RETURN TO VISUALIZATION button.
7. Position the Transmitter approximately 4-inches from the top of the II.

***Note:*** *Use a book or some other object to position the Transmitter 4-inches above the II.*

8. Press an X-ray switch and verify an image is displayed on the left Workstation monitor.
9. Select the CAPTURE IMAGE button on the FPD's touch screen.
10. Verify that the image displayed on the Workstation's left monitor is also displayed on the FPD.
11. Touch the Probe to the dimple on the Transmitter and verify that you can see the Probe's icon (green line with red dot) in the image on the FPD.

# Radiographic Beam Alignment Test

The Radiographic Beam Alignment Test requires the exposure and development of a film. If a film processor is not located on site, is not functional, or is unavailable, it will not be possible to perform this test. GE OEC may follow up with the customer to verify any reasons listed for not performing the Radiographic Beam Alignment Test. Record the information asked for in the corresponding sections of the *Report/Checklist*.

## Film Exposure

1. Check to see if a film processor is located on site.

   If a functional Film processor is located on site, proceed with test.

   If no film processor is on site, then you are not able to perform Radiographic Beam Alignment Test. Note this in the *9800 Installation Report/Checklist*.

   If the film processor is not functional, then you are not able to perform Radiographic Beam Alignment Test. Note this in the *9800 Installation Report/Checklist*.

***WARNING*** *The following steps produce X-rays. Use appropriate precautions.*

2. To nominalize C-Arm flexure, release the C-Arm brake and position the C-Arm at 45°.
3. Attach the Beam Alignment Tool on the Image Intensifier.
4. Load a film cassette in the Beam Alignment Tool.
5. Make the following four exposures on one sheet of film:
6. Select **Manual - Fluoro, Normal field** and then **Film** mode. Take a 55 KVp @ 1.5 mAs exposure.
7. Select **Manual - Fluoro, MAG 1 field** and then **Film** mode**.** Take a 55 KVp @ 1.5 mAs exposure.

8. Select **Manual - Fluoro, MAG 2 field** and then **Film** mode. Take a 55 KVp @ 1.5 mAs exposure.
9. Select **Manual** - **Fluoro** and completely close the collimator iris. Select **Film mode**. Take a 55 KVp @ 1.5 mAs exposure.
10. Remove the film cassette and develop the film.

## 50 mm x 50 mm Field Verification

1. Verify the 50 mm x 50 mm exposure, with the collimator iris closed, is within the 50 mm square in the middle of the beam alignment tool. If a stop sign pattern is displayed, measure the image from the center of the flats.

## Centering

1. Using the film and a ruler, draw lines from corner to corner of the film. This locates the center of the film.
2. Verify that the center of the image is centered on the center of the film.
3. Measure the offset distance in the X and Y planes ($X_{offset}$ and $Y_{offset}$) that the center of the image deviates from the center of the film, then in the *Report/Checklist*, record and add those offset values. Use the following equation:

   $X_{offset} + Y_{offset} = Sum$

   The sum should be less than 16mm (13/16″), or 2% of the SID.
4. The offsets' sum cannot be greater than 16mm (13/16″), or 2% of the SID. If it is, a beam alignment is necessary. Perform a beam alignment procedure to correct this deviation.

## Normal Field Verification

Use the Measurement Data table in the corresponding section of the *Report/Checklist* to record the measurements and calculations for the following steps:

1. Using the film, measure and record the Normal field exposure X and Y ($X_{Film}$ and $Y_{Film}$) diameters.
2. Make a Normal mode Fluoro exposure. Using the scale on the beam alignment tool, measure and record the X and Y diameters ($X_{Fluoro}$ and $Y_{Fluoro}$) displayed within the digital mask on the Workstation.

3. Calculate and record the absolute value of the difference between the film and Workstation X axis values ($X_{Film} - X_{Fluoro} = X_{Diff}$). Verify that the difference recorded is less than 28 mm (3% SID).
4. Calculate and record the absolute value of the difference between the film and Workstation Y axis values ($Y_{Film} - Y_{Fluoro} = Y_{Diff}$). Verify that the difference recorded is less than 28 mm (3% SID).
5. Calculate and record the sum of the values in Steps 3 and 4 ($X_{Diff} + Y_{Diff} = Sum$). Verify that the sum is less than or equal to 36 mm (4% SID).

## MAG1 Field Verification

Use the Measurement Data table in the corresponding section of the *Report/Checklist* to record the measurements and calculations for the following steps:

1. Using the film, measure and record the MAG1 field exposure X and Y ($X_{Film}$ and $Y_{Film}$) diameters.
2. Make a MAG1 mode Fluoro exposure. Using the scale on the beam alignment tool, measure and record the X and Y diameters ($X_{Fluoro}$ and $Y_{Fluoro}$) displayed within the digital mask on the Workstation.
3. Calculate and record the absolute value of the difference between the film and Workstation X axis values ($X_{Film} - X_{Fluoro} = X_{Diff}$). Verify that the difference recorded is less than 28 mm (3% SID).
4. Calculate and record the absolute value of the difference between the film and Workstation Y axis values ($Y_{Film} - Y_{Fluoro} = Y_{Diff}$). Verify that the difference recorded is less than 28 mm (3% SID).
5. Calculate and record the sum of the values in Steps 3 and 4 ($X_{Diff} + Y_{Diff} = Sum$). Verify that the sum is less than or equal to 36 mm (4% SID).

## MAG2 Field Verification

Use the Measurement Data table in the corresponding section of the *Report/Checklist* to record the measurements and calculations for the following steps:

1. Using the film, measure and record the MAG2 field exposure X and Y ($X_{Film}$ and $Y_{Film}$) diameters.

2. Make a MAG2 mode Fluoro exposure. Using the scale on the beam alignment tool, measure and record the X and Y diameters ($X_{Fluoro}$ and $Y_{Fluoro}$) displayed within the digital mask on the Workstation.
3. Calculate and record the absolute value of the difference between the film and Workstation X axis values ($X_{Film} - X_{Fluoro} = X_{Diff}$ ). Verify that the difference recorded is less than 28 mm (3% SID).
4. Calculate and record the absolute value of the difference between the film and Workstation Y axis values ($Y_{Film} - Y_{Fluoro} = Y_{Diff}$). Verify that the difference recorded is less than 28 mm (3% SID).
5. Calculate and record the sum of the values in Steps 3 and 4 ($X_{Diff} + Y_{Diff}$ = Sum). Verify that the sum is less than or equal to 36 mm (4% SID).

## Pass or Fail

If the measurements recorded for each field size (50 mm x 50 mm, NORM, MAG1 and MAG2) are within the limits specified, indicate in the *Report/Checklist* that the Beam Alignment Test passed. If it passed, continue with the Installation Procedure.

If the measurements recorded for each field size are not within the limits specified, indicate in the *Report/Checklist* that the Beam Alignment Test failed. If it failed, perform the beam alignment procedure contained in the 9800 C-Arm Service Manual.

# Preparing the Pallet for Return

Use the following procedure to return pallets for systems that have been delivered to locations within the United States.

1. Place all hardware removed from the C-Arm pallet such as turnbuckles, eyebolts, spacers, and guide wires, in a cardboard box or plastic bag and return the box and the pallet to GE OEC Medical Systems, Inc. Discard the C-Arm stabilizing brace and the cross-arm shipping block.
2. Leave a message in the GE OEC voice mail box, number 9600, stating where the pallet and hardware can be picked up. Include the hospital name, street address, city and state.

# Reporting

Upon Completion of the system installation, the technician performing the installation must complete and distribute the documentation listed below, as outlined in the instructions supplied in the Field Service Documentation package.

## Reporting for Domestic Systems

- For domestic US systems: Complete FDA form 2579. By law, reporting and distribution of this form must be done within 15 days from the date of assembly (installation).
- Verify the serial and model numbers listed on the back of the system and note these on FDA form 2579. Verify that the control numbers on the system agree with those listed on FDA form 2579. The Control Number, dash number, and manufacturing date must be noted on FDA form 2579.
- Distribute FDA form 2579 (all copies) and the *Installation Report/Checklist*, as outlined in Field Service Procedure FSP-10.
- The Field Service Report (FSR) or Child Case MUST list any and all deficiencies encountered during the installation of this system, including problem codes, descriptions and any parts which may have been replaced.
- The GE OEC Medical System, Inc. Representative MUST sign the Completion Form on the following page of this Installation Report and Checklist, verifying Field Service acceptance of the unit. If installation cannot be completed, the customer MUST be notified that the system is not yet ready for use.

## Reporting for International Systems

- Distribute the *Report/Checklist*, as outlined in Field Service Procedure No. FSP-10.

# Installation Comments

Write any comments important to the installation in the corresponding section of the *Report/Checklist*.